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CLAIMS

1. A compound of formula I

$$(CRa_2)p$$
 $(CRa_2)q$
 $(CRa_2)q$
 R^3
 $N-X$
 $Y-R^1$
 (I)

wherein X is O or NR¹¹ where R¹¹ is hydrogen, optionally substituted alkyl, optionally substituted aryl or optionally substituted heteroaryl;

Y is a single bond, C=O, C=S or S(O)_m where m is 0, 1 or 2;

R¹ is hydrogen, optionally substituted alkyl, optionally substituted alkoxycarbonyl, optionally substituted alkylcarbonyl, aminocarbonyl, optionally substituted alkylaminocarbonyl, optionally substituted dialkylaminocarbonyl, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted alkoxy, optionally substituted aryloxy, optionally substituted heteroaryloxy, optionally substituted heterocyclyloxy, cyano, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted cycloalkenyl, formyl, optionally substituted heterocyclyl, optionally substituted alkylthio, NO or NR¹³R¹⁴ where R¹³ and R¹⁴ are independently hydrogen, COR¹⁵, optionally substituted alkyl, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted heterocyclyl or R¹³ and R¹⁴ together with the N atom to which they are attached form a group -N=C(R¹⁶)-NR¹⁷R¹⁸; R¹⁵ is H, optionally substituted alkyl, optionally substituted alkoxy, optionally substituted aryl, optionally substituted aryloxy optionally substituted heteroaryl, optionally substituted heteroaryloxy or NR¹⁹R²⁰; R¹⁶, R¹⁷ and R¹⁸ are each independently H or lower alkyl; R¹⁹ and R²⁰ are independently optionally substituted alkyl, optionally substituted aryl or optionally substituted heteroarvl:

R² and R³ are independently hydrogen, halogen, cyano, optionally substituted alkyl, optionally substituted alkoxy or optionally substituted aryl;

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each R⁴ is independently halogen, nitro, cyano, optionally substituted C₁₋₈ alkyl, optionally substituted C₂₋₆ alkenyl, optionally substituted C₂₋₆ alkynyl, optionally substituted alkoxycarbonyl, optionally substituted alkylcarbonyl, optionally substituted alkylaminocarbonyl, optionally substituted dialkylaminocarbonyl, optionally substituted C₃₋₇ cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted heterocyclyl, optionally substituted alkoxy, optionally substituted aryloxy, optionally substituted heteroaryloxy, optionally substituted alkylthio or R²¹R²²N where R²¹ and R²² are, independently, hydrogen, C₁₋₈ alkyl, C₃₋₇ cycloalkyl, C₃₋₆ alkenyl, C₃₋₆ alkynyl, C₃₋₇ cycloalkyl(C₁₋ 4) alkyl, C_{2-6} haloalkyl, C_{1-6} alkoxy(C_{1-6}) alkyl, C_{1-6} alkoxycarbonyl or R^{21} and R^{22} together with the N atom to which they are attached form a five, six or sevenmembered heterocyclic ring which may contain one or two further heteroatoms selected from O, N or S and which may be optionally substituted by one or two C₁₋₆ alkyl groups, or 2 adjacent groups R⁴ together with the carbon atoms to which they are attached form a 4, 5, 6, or 7 membered carbocyclic or heterocyclic ring which may be optionally substituted by halogen; n is 0, 1, 2, 3 or 4; each Ra is independently hydrogen, halogen, hydroxy, cyano, optionally substituted C_{1-8} alkyl, optionally substituted C_{2-6} alkenyl, optionally substituted C_{2-6} alkynyl, optionally substituted alkoxycarbonyl, optionally substituted alkylcarbonyl, optionally substituted alkylaminocarbonyl, optionally substituted dialkylaminocarbonyl, optionally substituted C_{3-7} cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted heterocyclyl, optionally substituted alkoxy, optionally substituted aryloxy, optionally substituted heteroaryloxy, optionally substituted alkylthio, optionally substituted arylthio or R²³R²⁴N where R²³ and R^{24} are, independently, hydrogen, C_{1-8} alkyl, C_{3-7} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, C₃₋₇ cycloalkyl(C₁₋₄)alkyl, C₂₋₆ haloalkyl, C₁₋₆ alkoxy(C₁₋₆)alkyl, C₁₋₆ alkoxycarbonyl or R²³ and R²⁴ together with the N atom to which they are attached form a five, six or seven-membered heterocyclic ring which may contain one or two further heteroatoms selected from O, N or S and which may be optionally substituted by one or two C_{1-6} alkyl groups, or two Ra groups attached to the same carbon atom are =O or two Ra groups attached to adjacent carbon atoms form a bond, or two Ra

groups together with the carbon atom to which they are attached form a three- to

seven-membered ring, that may be saturated or unsaturated, and that may contain one or two hetero atoms selected from the group consisting of N, O and S, and which may be optionally substituted by one or two C₁₋₆ alkyl groups; or two Ra groups together form a group -CH₂-, -CH=CH- or -CH₂CH₂; p is 0, 1, 2, 3, 4, 5 or 6; q is 0, 1, 2, 3, 4, 5 or 6 provided that p+q is 1, 2, 3, 4, 5 or 6; R⁸ is optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted alkoxy, optionally substituted aryloxy, optionally substituted alkoxycarbonyl, optionally substituted alkylcarbonyl or optionally substituted alkenylcarbonyl; or salts or N-oxides thereof.

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- 2. A compound according to claim 1 wherein X is NH and Y is a single bond or C=0.
- 3. A compound according to claim 1 or claim 2 wherein each Ra is hydrogen and R² and R³ are each independently hydrogen, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy or cyano.
- A compound according to any preceeding claim wherein R^1 is hydrogen, C_{1-6} alkyl, 4. C_{1-6} cyanoalkyl, C_{1-6} haloalkyl, C_{3-7} cycloalkyl(C_{1-4})alkyl, C_{1-6} alkoxy(C_{1-6})alkyl, 20 heteroaryl(C_{1-6})alkyl (wherein the heteroaryl group may be optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy, C₁₋₆ haloalkoxy, C₁₋₆ alkylsulfonyl, C₁₋₆ alkylsulfinyl, C₁₋₆ alkylthio, C₁₋₆ alkoxycarbonyl, C₁₋₆ alkylcarbonylamino, arylcarbonyl, or two adjacent positions on the heteroaryl system may be cyclised to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring, itself optionally substituted with halogen), aryl(C₁₋₆)alkyl (wherein the aryl group may be 25 optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy, C₁-6 haloalkoxy, C₁₋₆ alkylsulfonyl, C₁₋₆ alkylsulfinyl, C₁₋₆ alkylthio, C₁₋₆ alkoxycarbonyl, C₁₋₆ alkylcarbonylamino, arylcarbonyl, or two adjacent positions on the aryl system may be cyclised to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring, itself optionally substituted with halogen), C₁₋₆ 30 alkylcarbonylamino(C_{1-6})alkyl, aryl (which may be optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy, C₁₋₆ haloalkoxy, C₁₋₆

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alkylsulfonyl, C₁₋₆ alkylsulfinyl, C₁₋₆ alkylthio, C₁₋₆ alkoxycarbonyl, C₁₋₆ alkylcarbonylamino, arylcarbonyl, or two adjacent positions on the aryl system may be cyclised to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring, itself optionally substituted with halogen), heteroaryl (which may be optionally substituted by halo, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{1-6} alkylsulfonyl, C₁₋₆ alkylsulfinyl, C₁₋₆ alkylthio, C₁₋₆ alkoxycarbonyl, C₁₋₆ alkylcarbonylamino, arylcarbonyl, or two adjacent positions on the heteroaryl system may be cyclised to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring, itself optionally substituted with halogen), C1-6 alkoxy, C1-6 haloalkoxy, phenoxy (wherein the phenyl group is optionally substituted by halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), heteroaryloxy (optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C_{1-6} alkoxy or C_{1-6} haloalkoxy), heterocyclyloxy (optionally substituted by halo, C_{1-6} alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy or C₁₋₆ haloalkoxy), cyano, C₂₋₆ alkenyl, C₂₋₆ alkynyl, C₃₋₆ cycloalkyl, C₅₋₇ cycloalkenyl, heterocyclyl (optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy or C₁₋₆ haloalkoxy), C₁₋₆ alkylthio, C_{1-6} haloalkylthio or $NR^{13}R^{14}$ where R^{13} and R^{14} are independently hydrogen, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy(C₁₋₆)alkyl, phenyl (which may be optionally substituted by halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino, dialkylamino or C₁₋₄ alkoxycarbonyl), phenyl (C₁₋₆)alkyl (wherein the phenyl group may be optionally substituted by halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino, dialkylamino, C_{1-6} alkylsulfonyl, C_{1-6} alkoxycarbonyl, or two adjacent positions on the phenyl ring may be cyclised to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring, itself optionally substituted with halogen), heteroaryl (C₁₋₆)alkyl (wherein the heteroaryl group may be optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy, C₁₋₆ haloalkoxy, C₁₋₆ alkylsulfonyl, C₁₋₆ alkylsulfinyl, C₁₋₆ alkylthio, C₁₋₆ alkoxycarbonyl, C₁₋₆ alkylcarbonylamino, arylcarbonyl, or two adjacent positions on the heteroaryl system may be cyclised to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring, itself optionally substituted with halogen) or heteroaryl (which may be optionally substituted by halo, nitro, cyano, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy or C₁₋₆ haloalkoxy, C₁₋₄

alkoxycarbonyl C_{1-6} alkylcarbonylamino, phenyloxycarbonylamino (wherein the phenyl group is optionally substituted by halogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), amino, C₁₋₆ alkylamino or phenylamino (wherein the phenyl group is optionally substituted halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino)).

A compound according to any preceeding claim wherein each R⁴ is independently 5. halogen, cyano, C₁₋₈ alkyl, C₁₋₈ haloalkyl, C₁₋₆ cyanoalkyl, C₁₋₆ alkoxy(C₁₋₆)alkyl, C₃₋₇ cycloalkyl(C_{1-6})alkyl, C_{5-6} cycloalkenyl(C_{1-6})alkyl, C_{3-6} alkenyloxy(C_{1-6})alkyl, C_{3-6} 10 alkynyloxy(C₁₋₆)alkyl, aryloxy(C₁₋₆)alkyl, C₁₋₆ carboxyalkyl, C₁₋₆ alkylcarbonyl(C₁₋₆ ₆)alkyl, C_{2-6} alkenylcarbonyl(C_{1-6})alkyl, C_{2-6} alkynylcarbonyl(C_{1-6})-alkyl, C_{1-6} alkoxycarbonyl(C₁₋₆)alkyl, C₃₋₆ alkenyloxycarbonyl(C₁₋₆)alkyl, C₃₋₆ alkynyloxycarbonyl(C_{1-6})alkyl, aryloxycarbonyl(C_{1-6})alkyl, C_{1-6} alkylthio(C_{1-6})alkyl, C_{1-6} alkylsulfinyl(C_{1-6})alkyl, C_{1-6} alkylsulfonyl(C_{1-6})alkyl, aminocarbonyl(C_{1-6})alkyl, 15 C_{1-6} alkylaminocarbonyl(C_{1-6})alkyl, di(C_{1-6})alkylaminocarbonyl(C_{1-6})alkyl, phenyl(C_{1-4})alkyl (wherein the phenyl group is optionally substituted by halogen, C_{1-4}) alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), heteroaryl (C_{1-4}) alkyl (wherein the heteroaryl group is optionally substituted by halo, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy or C_{1-6} 20 haloalkoxy), heterocyclyl(C_{1-4})alkyl (wherein the heterocyclyl group is optionally substituted by halo, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy or C_{1-6} haloalkoxy), C₂₋₆ alkenyl, aminocarbonyl(C₂₋₆)alkenyl, C₁₋₆ alkylaminocarbonyl(C₂-6) alkenyl, di(C₁₋₆) alkylaminocarbonyl(C₂₋₆) alkenyl, phenyl(C₂₋₄)-alkenyl, (wherein the phenyl group is optionally substituted by halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ 25 haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), C₂₋₆ alkynyl, trimethylsilyl(C₂₋₆)alkynyl, aminocarbonyl(C₂₋₆)alkynyl, C₁₋₆ alkylaminocarbonyl(C₂₋₆)alkynyl, di(C₁₋₆)alkylaminocarbonyl(C₂₋₆)alkynyl, C₁₋₆ alkoxycarbonyl, C₃₋₇ cycloalkyl, C₃₋₇ halocycloalkyl, C₃₋₇ cyanocycloalkyl, C₁₋₃ alkyl(C₃₋₇)-cycloalkyl, C₁₋₃ alkyl(C₃₋₇)halocycloalkyl, phenyl (optionally substituted by 30 halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), heteroaryl (optionally substituted by halo, nitro,

cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy or C_{1-6} haloalkoxy), heterocyclyl (wherein the heterocyclyl group is optionally substituted by halo, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy or C_{1-6} haloalkoxy), or 2 adjacent groups R^4 together with the carbon atoms to which they are attached form a 4, 5, 6 or 7 membered carbocylic or heterocyclic ring which may be optionally substituted by halogen, C_{1-8} alkoxy, C_{1-6} haloalkoxy, phenoxy (optionally substituted by halo, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy or C_{1-6} haloalkoxy), heteroaryloxy (optionally substituted by halo, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy or C_{1-6} haloalkoxy), C_{1-8} alkylthio or $R^{19}R^{20}N$ where R^{19} and R^{20} are, independently, hydrogen, C_{1-8} alkyl, C_{3-7} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, C_{2-6} haloalkyl, C_{1-6} alkoxycarbonyl or R^{19} and R^{20} together with the N atom to which they are attached form a five, six or seven-membered heterocyclic ring which may contain one or two further heteroatoms selected from O, N or S and which may be optionally substituted by one or two C_{1-6} alkyl groups; and n is 0, 1, 2 or 3.

6. A compound according to any preceding claim wherein R⁸ is C₁₋₁₀ alkyl, C₁₋₁₀ haloalkyl, aryl(C₁₋₆)alkyl (wherein the aryl group is optionally substituted by halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), heteroaryl(C₁₋₆)alkyl (wherein the heteroaryl group is optionally substituted by halogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, C₁₋₄ haloalkyl, C₁₋₄ haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino), arylcarbonyl-(C₁₋₆)alkyl (wherein the aryl group may be optionally substituted by halogen, C₁₋₄ alkyl,

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 C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino and the alkyl group may be optionally substituted by aryl), C_{2-8} alkenyl, C_{2-8} haloalkenyl, aryl(C_{2-6})-alkenyl (wherein the aryl group is optionally substituted halogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, CN, NO₂, aryl, heteroaryl, amino or dialkylamino, C_{1-6} alkoxycarbonyl, or two adjacent substituents can cyclise to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring), heteroaryl(C_{2-6})-alkenyl (wherein the heteroaryl group is optionally substituted halogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, CN, NO₂, aryl,

heteroaryl, amino or dialkylamino, C_{1-6} alkoxycarbonyl, or two adjacent substituents can cyclise to form a 5, 6 or 7 membered carbocyclic or heterocyclic ring), C_{2-6}

alkynyl, phenyl(C_{2-6})alkynyl (wherein the phenyl group is optionally substituted by halogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, C_{1} , C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyl, C_{1-6} haloalkylcarbonyl or aryl(C_{2-6})alkenylcarbonyl (wherein the aryl group may be optionally substituted halogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, C_{1} , C_{1-4} haloalkoxy, C_{1-4} haloalkoxy, C_{1-4} haloalkoxy, C_{1-4} haloalkoxy, C_{1-4} haloalkoxy, C_{1-4} haloalkyl, amino or dialkylamino), or $-C(R^{51})(R^{52})$ - $[CR^{53}=CR^{54}]z$ - R^{55} where z is 1 or 2, R^{51} and R^{52} are each independently C_{1-4} haloalkyl and C_{1-4} alkyl or C_{1-4} haloalkyl and C_{1-4} alkyl or C_{1-4} haloalkyl substituted aryl or optionally substituted heteroaryl.

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- 7. A compound according to any preceeding claim wherein p is 1 or 2 and q is 2.
- 8. A compound of formula II

$$(CRa_2)p$$
 $(CRa_2)q$
 $(CRa_2)q$
 R^3
 (II)

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wherein R^2 , R^3 , R^4 , R^8 , Ra, n, p and q are as defined in claim 1 and R^8 may also be hydrogen or or *tert*-butoxycarbonyl; or a compound of formula III

$$(CRa_2)p$$
 $(CRa_2)q$
 $(CRa_2)q$
 R^3
 $N-X$
 $Y-R^1$
 $(IIII)$

wherein X, Y, R¹, R², R³, R⁴, Ra, n, p and q are as defined in claim 1 and R⁸ is hydrogen or *tert*- butoxycarbonyl.

WO 2005/058836 PCT/IB2004/004108

- 9. An insecticidal acaricidal and nematicidal composition comprising an insecticidally, acaricidally or nematicidally effective amount of a compound of formula I as defined in claim 1.
- 10. A a method of combating and controlling insects, acarines, nematodes or molluscs which comprises applying to a pest, to a locus of a pest, or to a plant susceptible to attack by a pest an insecticidally, acaricidally, nematicidally or molluscicidally effective amount of a compound of formula I.

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